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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,153	11/29/2001	Chieng-Hwa Lin	016295.0732	5467

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EXAMINER	
HOANG, PHUONG N	
ART UNIT	PAPER NUMBER
2194	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/998,153	LIN ET AL.	
	Examiner	Art Unit	
	Phuong N. Hoang	2194	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

WILLIAM THOMSON
SUPERVISORY PATENT EXAMINER

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1 – 20 are pending for examination.

2. This office action is in response to amendment file 11/27/06.

3. References, not found in this office action, can be found in previous office actions.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1 – 11, 13 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matia "Kernel Korner Writing a Linux Driver" pages 1 – 12 in view of Itoh, "SCONE: Using Concurrent Objects for Low-level Operating System Programming" pages 385 – 398.

5. **As to claim 1**, Matia teaches a method for establishing a device driver (Linux driver, title) in an open source operating system (Linux operating system is an open source operating system), comprising the steps of:

Providing a device driver having at least one module in executable form (Linux driver is a module or software executable, title and page 2 lines 17 – 20 and page 4, figure 5 and associated paragraph)

compiling the driver against the kernel of the open source operating system after each modification to the kernel of the open source operating system (driver is compiler alone before linking to the kernel, and re-compile after being call by the kernel, page 2, and intergration in the kernel section of page 10 and page 11);

wherein the driver acts as an interface between the kernel of the operating system and device (a set of drivers, page 2).

Matia does not explicitly teach the device driver having a service layer that interface between the kernel of the operating system and at least of executable modules. However, Matia teaches a set of drivers used for communicating with kernel and device. Therefore, one of the drivers has to interface with the rest of the drivers (figure 1 and page 6 and associated paragraph).

Itoh teaches a device driver having a service layer for that interface between kernel and lower-layer drivers (service layer for each type of low-level system code, section 3.1, 4, 4.1, 4.5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Matia and Itoh's system because Itoh's service layer would be flexible and easy to modifying and compiling the code when accessing the kernel.

6. **As to claim 2**, Matia teaches associating the naming convention of function calls in the kernel to the naming convention of expected function calls in the device driver (perform a call, page 2).

7. **As to claim 3**, Matia teaches linking the compiled service layer to the at least one module in executable form to form the device driver (linking, page 11 lines 10 – 12).

8. **As to claim 4**, Matia teaches the step of storing the device driver in memory (memory, page 1 lines 10 - 20).

9. **As to claim 5**, Matia teaches providing a device driver having multiple modules in executable form, each of the modules associated with hardware architecture of a computer system (driver functions, page 2 lines 20 - 30).

10. **As to claims 6-7**, they are rejected for the same reason as claims 3-4 above.

11. **As to claim 8**, it is the system claim of claim 1. See rejection for claim 1 above. In addition, Itoh teaches the service layer receives kernel-specific function calls from the kernel of the operating system (pages 387 - 338).

12. **As to claims 9 - 10**, see rejection for claims 4 - 5 above.

13. **As to claim 11**, see rejection for claim 2 above.

14. **As to claim 13**, this is a method for loading a device driver in a computer system claim that corresponds to the method claim 1 and method claim 3. Therefore, it is rejected for the same reason as claims 1 and 3 above.

15. **As to claim 14**, see rejection for claim 11 above.

16. **As to claim 15**, Matia teaches the step of recompiling (re-compile, page 10).

17. **As to claim 16**, see rejection for claim 3 above.

18. **As to claim 17**, Matia and Itoh do not specifically teach the step of determining, prior to compilation of the open source service layer, whether a precompiled device driver exists that is associated with the kernel of the operating system and loading the precompiled device driver if such a device driver exists.

It would have been obvious to one of ordinary skill in the art at the time of invention was made to determine whether a precompiled device driver associated with the kernel of the operating system existed and load it prior to compiling the open source service layer. One of the ordinary skill in the art would have been motivated to check for the existence of a precompiled device driver and load it before compiling to

save compiling time and computational cycles, thereby allowing the computer system to operate more efficiently.

19. **As to claim 18**, Matia modified by Itoh teaches the step of wherein the function calls passed between the kernel of the operating system and the compiled open source service layer are not specific to the hardware architecture of the computer system; and wherein the function calls passed between the compiled open source service layer and the precompiled driver modules are specific to the hardware architecture of the computer system (figure 1).

20. **As to claim 19**, see rejection for claim 15 above.

21. **As to claim 20**, see rejection for claim 11 above.

22. Claim 12 is rejected under 35 U.S.C. 103(a) a: being unpatentable over Matia "Kernel Korner Writing a Linux Driver" pages 1 – 12 in view of Itoh, "SCONE: Using Concurrent Objects for Low-level Operating System Programming" pages 385 – 398, and further in view of Broman, U.S. Patent 6754858.

23. **As to claim 12**, Matia and Itoh do not specifically teach the name

convention comprises the use of a suffix for the naming of function calls, the suffix providing a naming convention that is specific to the kernel of the operating system.

Broman teaches a naming convention in which a three-letter sumx is appended to the template name (col. 17, lines 42-44).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Matia, Itoh, and Broman's systems because Broman's step of using the suffix for the naming of function calls that are specific to the kernel would make function calls more understandable by making them easier to read and maintain. They can also give information about the function of the identifier that can be helpful in understanding the calls.

Response to Arguments

24. Applicant's arguments filed 11/26/06 have been fully considered but they are not persuasive.

25. Applicant argued in substance that

(1) Matie makes no mention of service layers in open source form.

(2) Matie teaches the recompilation occurs after a modification to the driver, not after each modification to the kernel. It is not the same as "compiling the service layer against the kernel".

26. Examiner respectfully disagree with applicant's argument

As to point 1, Linux operating system is an open operating system, and the service layer is the layer that interfaces between the kernel and the driver (specification, page 8). Matie teaches Linux operating system and driver (title and pages 1 – 12), the service layer (figure 1 and page 2). Also, once the Matie teaches the Linux kernel and drivers, the service layer is inherent for the kernel calls drivers (page1 and 2).

As to point 2, once the kernel calls drivers, and the driver is compiled after modification; it means the driver recompilation against the kernel and to intergrate into the kernel (page 2 and 7).

Conclusion

27. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong N. Hoang whose telephone number is (571)272-3763. The examiner can normally be reached on Monday - Friday 9:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Thomson can be reached on 571-272-3718. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ph
February 9, 2007

WILLIAM THOMSON
SUPERVISORY PATENT EXAMINER